

REMARKS

In response to the above Office Action, claim 1 has been amended to restrict claim 1 to a sewing thread containing 30% by weight or more of a staple fiber formed out of one type of poly(methylene terephthalate). The elastic recovery range of the sewing thread at 5% elongation has also been restricted to 30 to 65%.

Support for the staple fiber being formed out of one type of poly(trimethylene terephthalate) can be found on page 7, lines 18 and 19 of the specification and Example 1. Table 2 on page 34 shows that the thread of Example 1 had “an instantaneous elastic recover at 5% elongation of 65%.”

In the Office Action the Examiner rejected claims 1-3 under 35 U.S.C. §102(b) for being anticipated by Hietpas. Claims 4 and 5 were rejected under 35 U.S.C. §103(a) for being obvious over Hietpas.

In contrast to the invention as now set forth in claim 1, Hietpas discloses a bicomponent staple fiber formed out of two types of a polyester component such as PET (poly(ethylene terephthalate)) and PTT (poly(trimethylene terephthalate)). See paragraph [0034] of Hietpas.

Moreover, the Examiner comments that Hietpas “teaches” a yarn having an instantaneous elastic recovery at 5% elongation of “70-100%.” See page 3, lines 7-10 of the Office Action. It is realized that Applicants noted in the last Reply that a staple fiber of a spun yarn “like” Hietpas would have an instantaneous elastic recovery at 5% elongation of 70 to 100%, referring to page 17, line 8 of the present specification, but it is not seen where Hietpas actually teaches this. Clarification of this comment would be appreciated.

In any event, the claimed range of the elastic recovery of the sewing thread at 5% elongation is now limited to 30 to 65% to avoid any overlap with a range of 70 to 100%.

Accordingly, it is believed for at least these two reasons, claims 1-3 cannot be considered to be anticipated by Hietpas. Withdrawal of Hietpas as a ground of rejection of the claims under §102(b) is therefore requested.

Nor should Applicants' claimed invention be considered obvious from the teachings of Hietpas, because Applicants' invention relates to a sewing thread which requires different properties than the intended use of the yarn of Hietpas.

Fibers are used in many technical fields, and many kinds of fibers are suitable for use in each field.

For example, a fiber for a woven/knitted fabric (as disclosed in Hietpas) requires properties such as wearing comfortability and ease of handling of the resultant fabric. On the other hand, a fiber for a sewing thread requires properties such as seam stretchability and high speed sewing performance.

Accordingly, a fiber for a sewing thread is quite different in the properties required compared to a fiber for a woven/knitted fabric, even if both fibers comprise the same material. In other words, a fiber for a sewing thread is in a different technical field than a fiber for a woven/knitted fabric.

The present inventors have diligently investigated fibers for a sewing thread and have found what the required properties are of a fiber for a sewing thread, and as a result, have accomplished the present invention.

An object of the present invention is to provide a sewing thread compatible with both high seam stretchability and high speed sewing performance. In general, a sewing thread having high seam stretchability is inferior in high speed sewing performance due to a small loop formation of a needle thread during lock stitch sewing. That is, a high seam stretchability and a high speed sewing performance are inconsistent with each other in a sewing thread.

The present invention has solved the above problem and provides a sewing thread that is compatible with both high seam stretchability and high speed sewing performance.

On the other hand, an object of Hietpas is to provide a spun yarn having high stretch characteristics. A problem to be solved or an object of Hietpas is to provide a highly stretchable fabric by using the disclosed yarn. Accordingly, there is no disclosure or suggestion regarding a sewing thread and the problems peculiar to a sewing thread such as high seam stretchability and high speed sewing performance.

The present inventors have investigated in detail the relationship between a seam formation mechanism and various elongation properties of a sewing thread concerning the factors affecting the relationship. As a result, the present inventors found that a breaking elongation greatly contributes to imparting stretchability to the seam, and that an instantaneous elastic recovery in a low elongation region greatly contributes to a sewing performance. That is, the present inventors found that suppression of an instantaneous elastic recovery makes the loop formation stable, and as a result, the effect thereof is fully exhibited especially during high speed sewing.

As explained in the previous Reply, it is to be noted that the breaking elongation and the instantaneous elastic recovery at 5% elongation as set forth in claim 1 are not properties of the spun yarn, but the properties of the sewing thread.

The sewing thread of the present invention has an instantaneous elastic recovery at 5% elongation of 30 to 65% and is formed from a spun yarn (a raw material) having an instantaneous elastic recovery at 5% elongation of 70 to 100%, as disclosed on page 17, lines 4 to 8 of the specification. Accordingly, the spun yarn (a raw material) cannot be used as the sewing thread as it is, because an instantaneous elastic recovery at 5% elongation of the spun yarn would be too high to have a good sewing performance.

The sewing thread of the present invention having the claimed specific properties (a breaking elongation and an instantaneous elastic recover at 5% elongation) can be produced by doubling and twisting the spun yarns, and then by wet heat treating the resultant yarn at 90% or more under a relaxing state.

Accordingly, the specific properties are different from the inherent properties of a poly(trimethylene terephthalate) - based spun yarn as a raw material.

On the other hand, the fiber disclosed in Hietpas is a spun yarn composed of cotton and a staple fiber formed out of two types of polyester component such as PET (poly(ethylene terephthalate)) and PTT (poly(trimethylene terephthalate)).

Thus, it is clear that the spun yarn disclosed in Hietpas is not the same as the raw material of the sewing thread of the present invention. Consequently, it could not have or even be remotely similar to the sewing thread of claim 1.

As required by M.P.E.P. §2142, to establish a prima facie case of obviousness, it is necessary there be a clear articulation of the reasons why the claimed invention would have been obvious from the cited references. In light of the noted failures of Hietpas, it is submitted that this test has not been met.

Regarding claims 4 and 5, since these claims depend from claim 1, it is believed that they are patentable over Hietpas for the same reasons expressed above.

It is believed claims 1-5 are in condition for allowance.

Please grant any extensions of time required to enter this Reply and charge any additional required fees to Deposit Account 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

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By: 

Arthur S. Garrett
Reg. No. 20,338
(202) 408-4091

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